states that this combination of pore diameters and thicknesses overlaps that providing the gas permeation rates applicant has stated provides the claimed limit current density. Hence, the Examiner concludes, the protective layer of Fujii would appear to inherently possess that claimed limit current density. Applicants respectfully disagrees. Indeed, it is respectfully submitted that Fujii's disclosure of a protective layer having a thickness and average pore size diameter as stated is not *per se* evidence that Fujii's sensor possesses the same limit current density as this invention, as explained hereinbelow.

The limit current density, as described in applicants' specification (page 11, lines 1-4) is obtained by dividing the limit current value by a unit area of a reference gas side electrode. The limit current (lp) proportional to a diffusion coefficient (D).

$$lp = \frac{nF}{RT} \cdot P \cdot D \cdot \frac{A}{L} \cdot X \quad \text{----------(1)}$$

n: electronic charge number in an electrode reaction, R: gas constant, F: Faraday constant, T: element temperature, P: gas pressure, A: effective cross section (i.e., area of electrode), L: effective diffusion distance (only in diffusion layer), D: diffusion coefficient, X: concentration of a component in the exhaust gas.

The diffusion coefficient D is inversely proportional to a flex coefficient (τ).

$$D = \frac{\varepsilon}{\tau} \cdot D' \quad \text{----------(2)}$$

ε: porosity, τ: flex coefficient, D': molecular diffusion coefficient or Knudsen diffusion coefficient.

The flex coefficient (τ) represents the degree of flex in the flow of a gas passing in a porous body.

As is apparent from the above and in particular equations (1) and (2), the limit current density is dependent on several parameters. This is why Fujii does not *ipso facto* disclose a sensor having the same limit current density as the invention simply because Fujii discloses a protective layer having a thickness of 100 to 300 microns and an average pore size diameter of 0.01 to 0.3 microns. Indeed, from this information alone it does not necessarily follow that Fujii has the same limit current density as the invention. Thus, it can not properly be said, in the absence of further evidence, that Fujii anticipates or renders obvious the invention.

Furthermore, the manufacturing method for the protective layer in an embodiment of the invention is different from Fujii. In this regard, in an exemplary embodiment of the invention, the gas sensing element is a type that requires the step of integrally sintering the solid electrolytic substrate and the electrode protecting layer (e.g., see dependent claim 4 and refer to page 9, line 19 - page 10, line 8). In contrast, the gas sensing element disclosed in Fujii is of a type that requires the step of dipping a sintered solid electrolyte body into a slurry to form the protecting layer (see column 12, lines 38-60).

When the manufacturing method for the protecting layer is different, the degree of flex (i.e., the flex coefficient τ in the above equation (2)) differs greatly. Thus, the flex coefficient defers substantially between the disclosed embodiment of the invention and Fujii as illustrated on the attached sheet. (See also attached supplemental sheet explaining two illustrations).

In other words, based on the difference in the manufacturing method between a disclosed embodiment of the present invention and Fujii, it is clear that the limit current density of the Fujii sensor would be different from the limit current density of the sensor according to the invention. Thus, just because Fujii's disclosure overlaps isolated parameters disclosed by applicant does not mean that Fujii anticipates nor renders

obvious the invention because these parameters are not the sole determinants of the claimed current limit density. Accordingly, this overlap does not mean that Fujii meets all the limitations of applicant's independent claim. On the contrary, it is respectfully submitted that Fujii's limit current density would be understood to be different from that claimed by applicant because Fujii uses a slurry dip to arrive at the specified protective layer whereas in a preferred embodiment of the invention integral sintering is used.

It is therefore respectfully submitted that when the pore structure of the manufactured protecting layer is different, as is the case with the invention and Fujii, it is inappropriate to summarily conclude that the claimed structure is anticipated or obvious, because Fujii's disclosure is incomplete in respect to a teaching of the claimed invention.

The Examiner's further reliance on Mase does not overcome the deficiencies of Fujii noted above. Irrespective of the teachings of Mase alleged by the Examiner, it is respectfully submitted that it would be unobvious without the benefit of applicant's disclosure to modify the manner in which the Fujii sensor is formed. As noted above, Fujii teaches, in particular beginning at column 12, line 56, that slurry is applied on to the surface of the outer electrode by dipping. Before the dipping and after the solid electrolyte body is formed, the previously sintered solid electrolyte body is made irregular on surfaces thereof by etching hollowed by chemical plating to form an inner electrode and outer electrode (see column 12, lines 40-45). Thus, it would not be possible to practice the Fujii invention as disclosed if Fujii was integrally sintered.

It is clear that the initial burden of establishing a basis for denying patentability to a claimed invention rests upon the Examiner. In re Piasecki, 745 F. 2d 1468, 223 USPQ 785 (Fed. Cir. 1984). In establishing a *prima facie* case of obviousness under 35 U.S.C. § 103, it is incumbent upon the Examiner to provide a reason why one of ordinary skill in the art would have been led to arrive at the claimed invention from the prior art. Ex parte Clapp, 227 USPQ 972 (BPAI 1985). To this end, the requisite motivation must stem from some teaching, suggestion or inference in the prior art as a whole or from the knowledge generally available to one of ordinary skill in the art and

not from applicant's disclosure. See, for example, Uniroyal, Inc. v. Rudkin-Wiley Corp. 837 F.2d 1044, 7 USPQ 2d 1434 (Fed. Cir. 1988).

Section 103 does not allow the Examiner to engage in picking and choosing from the prior art only to the extent that it will support a holding of obviousness, while excluding parts of the prior art essential to the full appreciation of what the prior art suggests to one of ordinary skill in the art. In re Wesslau, 147 USPQ 391 (CCPA 1975). Moreover, it is not proper under 35 USC 103 to modify a prior art patent in a manner which would destroy that on which the invention of the prior art patent was based. Ex parte Hartman, 186 USPQ 366,67 (PTO Bd. App. 1974).

Since the Examiner's proposed modification of Fujii in view of Mase would be contrary to Fujii's disclosure and is not motivated by the record prior art, in the absence of applicant's disclosure, it is respectfully submitted that the Examiner's proposed combination of Fujii and Mase is improper under 35 USC 103. Reconsideration and withdrawal of the rejections based on Fujii taken alone and also in combination with Mase are respectfully requested.

Attached hereto are two Japanese documents for consideration by the Examiner. English translations of these Japanese documents are being prepared and will be forwarded upon completion. A Request for Continued Examination is being concurrently filed. Therefore, it is understood that no fee is required for this Information Disclosure Statement to be considered. If however, a fee is due, please contact the undersigned for authorization to charge the undersigned's deposit account .

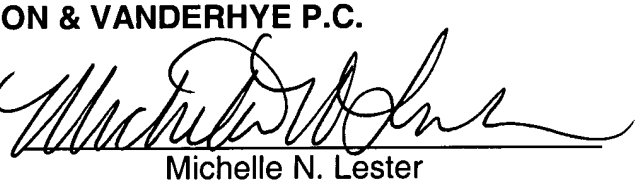
This Information Disclosure Statement is intended to be in full compliance with the rules, but should the Examiner find any part of its required content to have been omitted, prompt notice to that effect is earnestly solicited, along with additional time under Rule 97(f), to enable Applicant to comply fully.

Consideration of the foregoing and enclosures plus the return of a copy of the herewith Form PTO-1449 with the Examiner's initials in the left column per MPEP 609 are earnestly solicited.

All objections and rejections having been addressed, it is respectfully submitted that the present application is in condition for allowance and an early Notice to that effect is earnestly solicited.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: 

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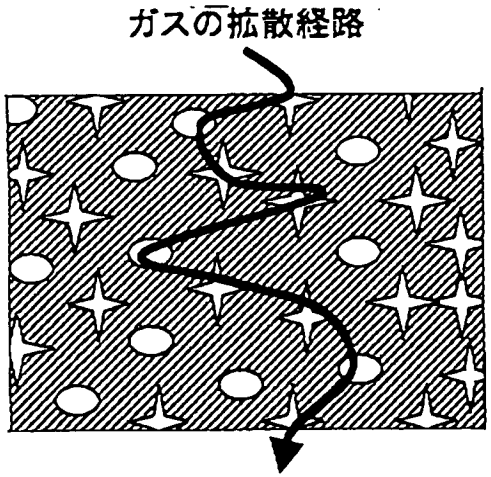
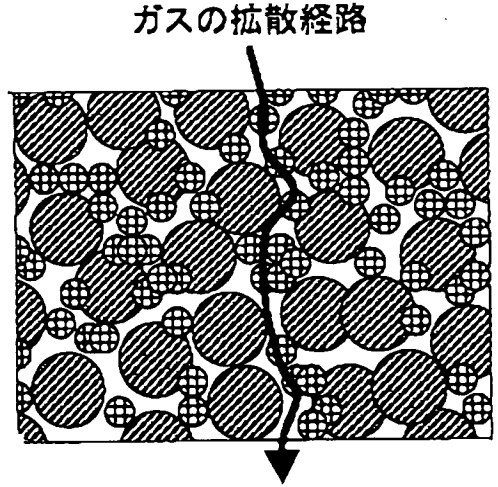
別紙

本願発明	Fujii
本願発明の多孔質体断面模式図 本願発明の電極保護層は、グリーンシートを1500℃で1時間焼成したもの  本願発明の電極保護層は焼成体内部にある孔をガスが拡散するものであり、大きく屈曲してガスが流れる	Fujiiの多孔質体断面模式図 粗粒子と細粒子とを混合したスラリーを塗布し、700℃で加熱、焼き付けしたもの  Fujiiの保護層は粗粒子と細粒子の隙間をガスが拡散するものであり、小さな屈曲にてガスが流れる

FOR INFORMATION ONLY

FOR INFORMATION ONLY

別紙 Supplemental sheet
本願発明 Present Invention
本願発明の多孔質体断面模式図
cross-sectional view of a porous body according to this invention
本願発明の電極保護層は、グリーンシートを１５００° C で１時間焼成したもの
an electrode protective layer of this invention is obtained by sintering a green sheet at the temperature of 1,500°C
ガスの拡散経路 gas diffusion path
本願発明の電極保護層は焼成体内部にある孔をガスが拡散するものであり、大きく屈曲してガスが流れる
According to the structure of the electrode protective layer of this invention, the gas diffuses across pores in a sintered body and therefore the gas flow route winds largely as shown by an arrow.

Fujiiの多孔質体断面模式図
cross-sectional view of a porous body disclosed in Fujii
粗粒子と細粒子とを混合したスラリーを塗布し、７００° Cで加熱、焼付けしたもの
a slurry of mixed coarse and fine grains is coated and heated at the temperature of 700°C and then sintered.
ガスの拡散経路 gas diffusion path
Fujiiの保護層は粗粒子と細粒子の隙間をガスが拡散するものであり、小さな屈曲にてガスが流れる
According to the structure of the protective layer of Fujii, the gas diffuses along the clearance between the coarse and fine grains and therefore the gas flow route is relatively straight as shown by an arrow.